

(No Model.)

3 Sheets—Sheet 1.

W. J. HATTON.
DRILL.

No. 592,142.

Patented Oct. 19, 1897.

Fig. 2.

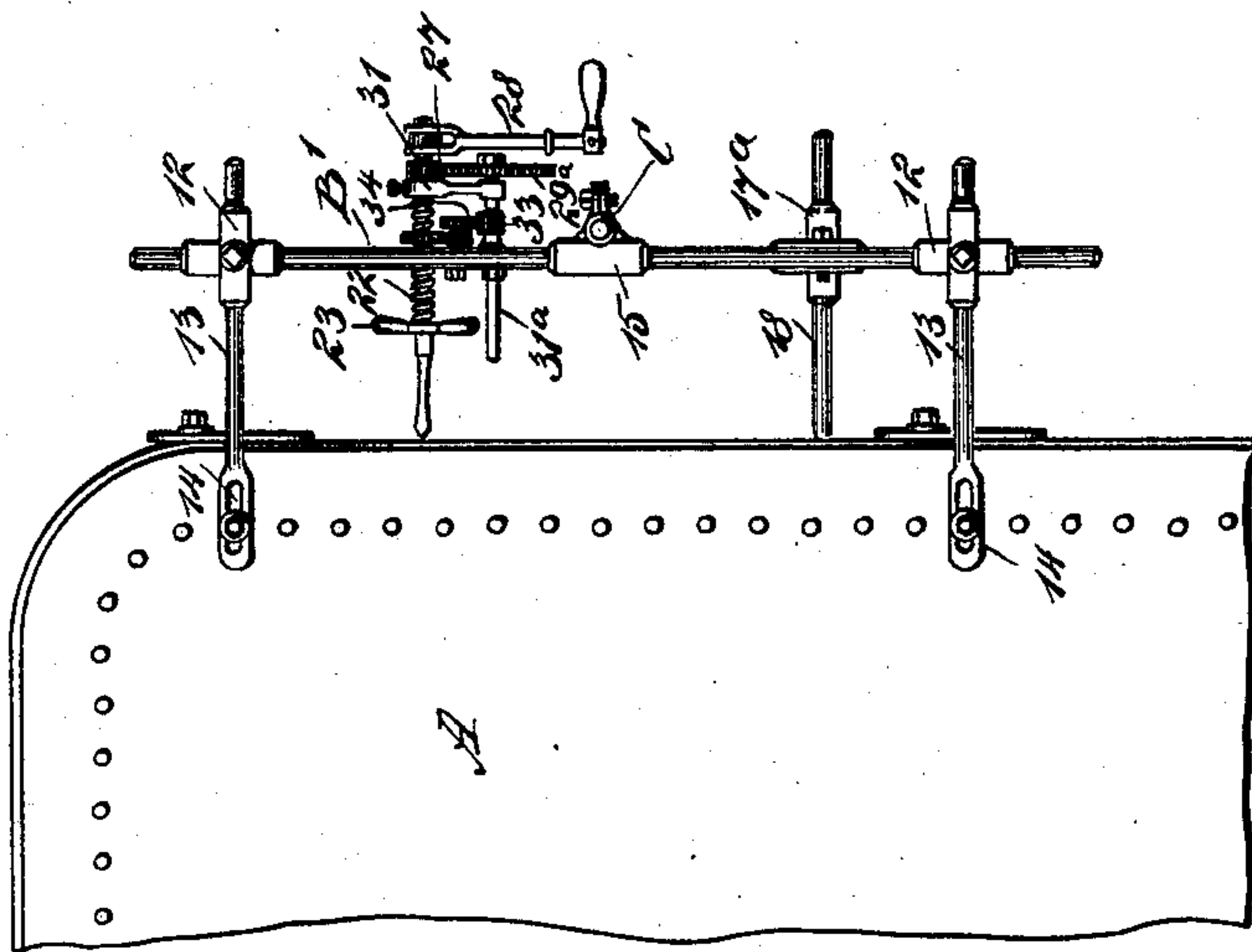
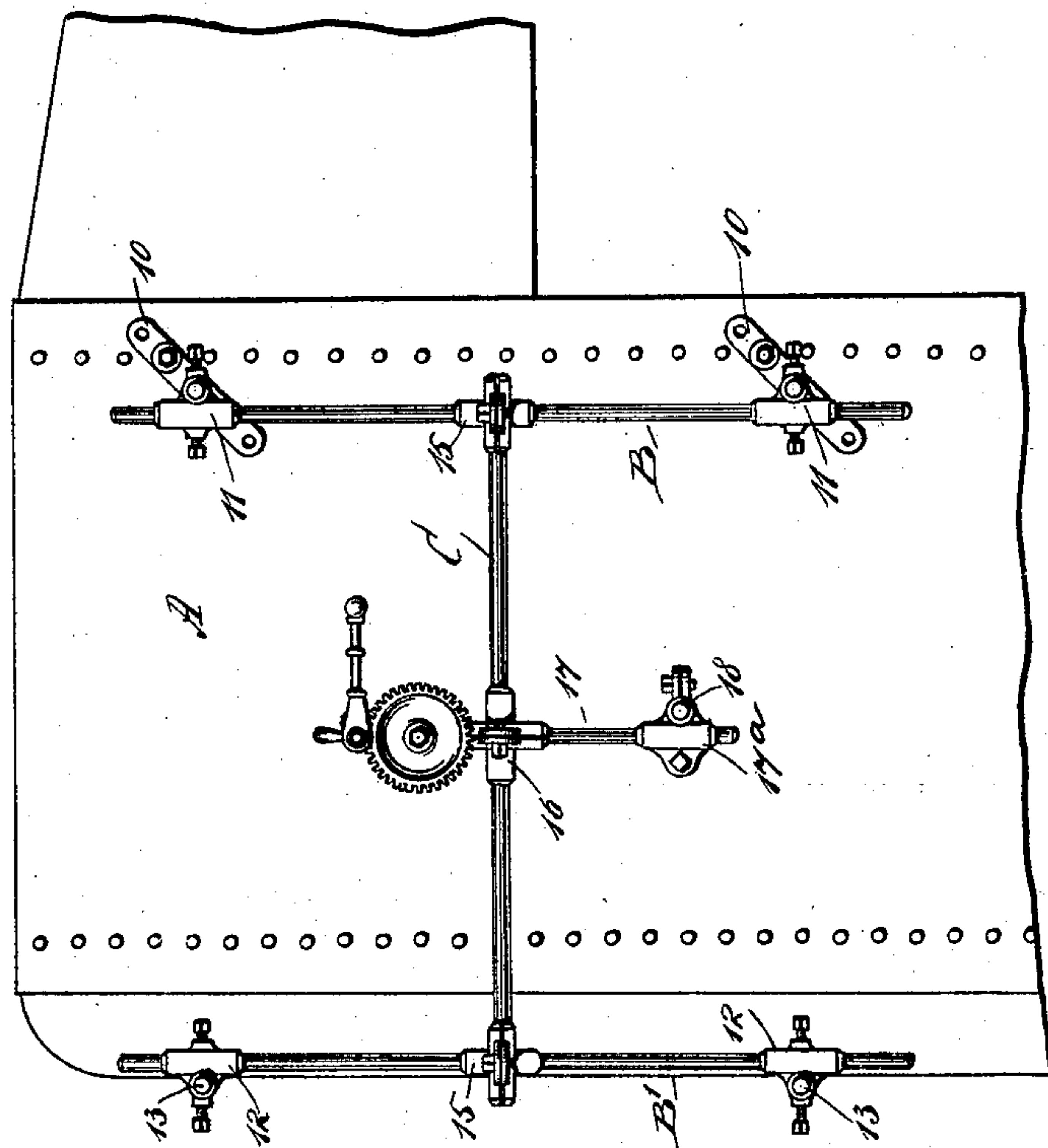


Fig. 1.



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Fig. 4.

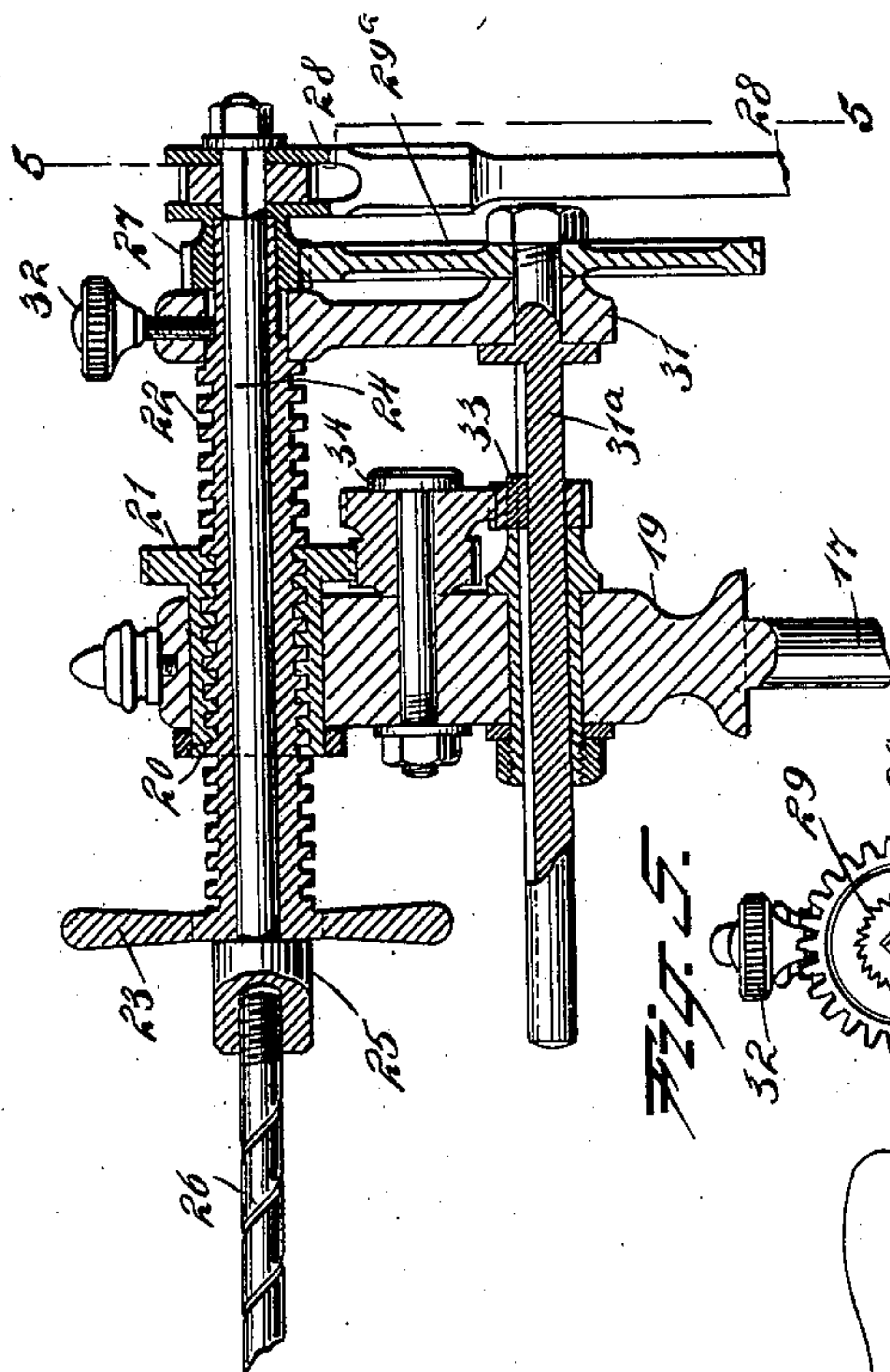


Fig. 5.

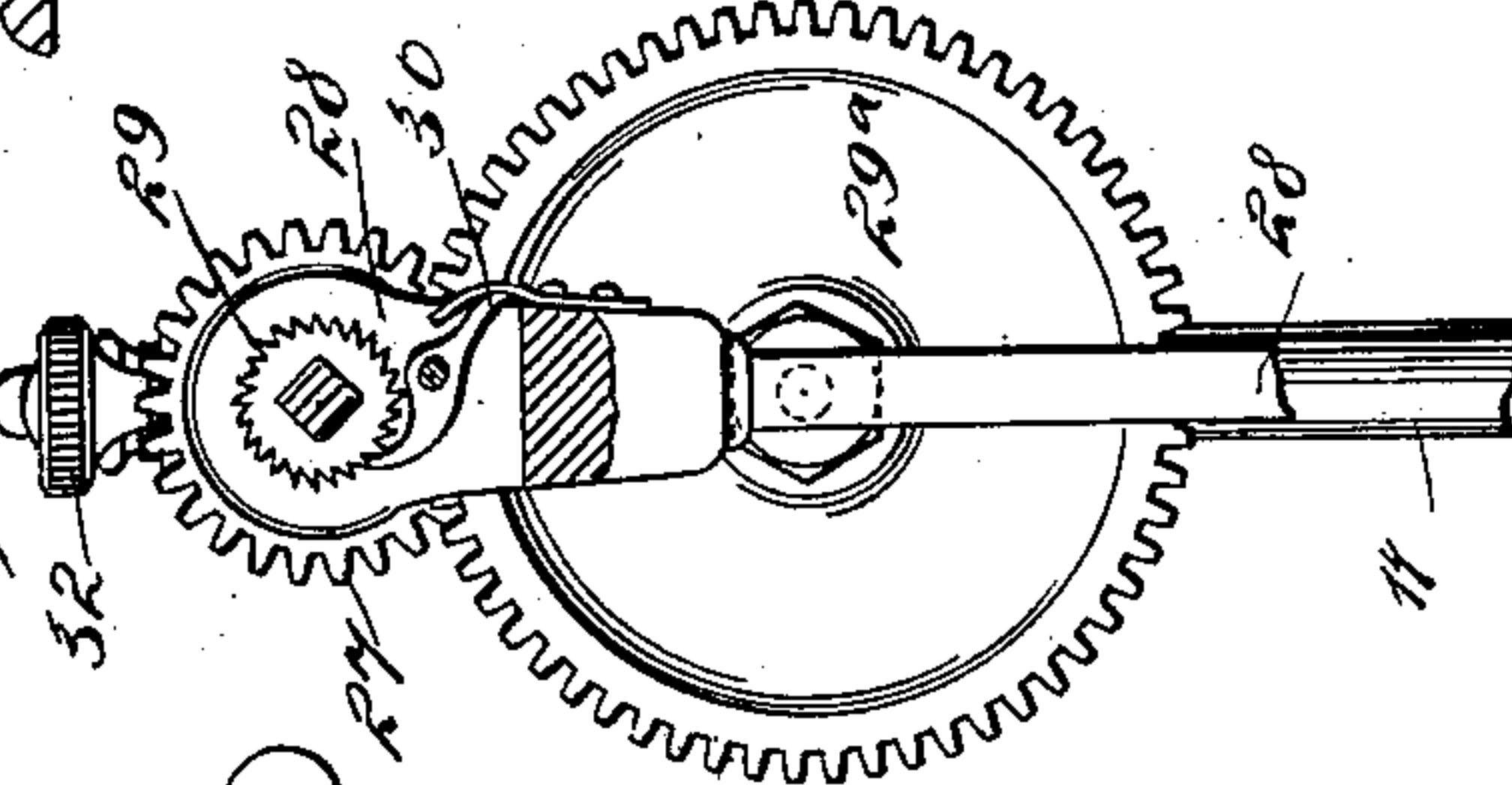
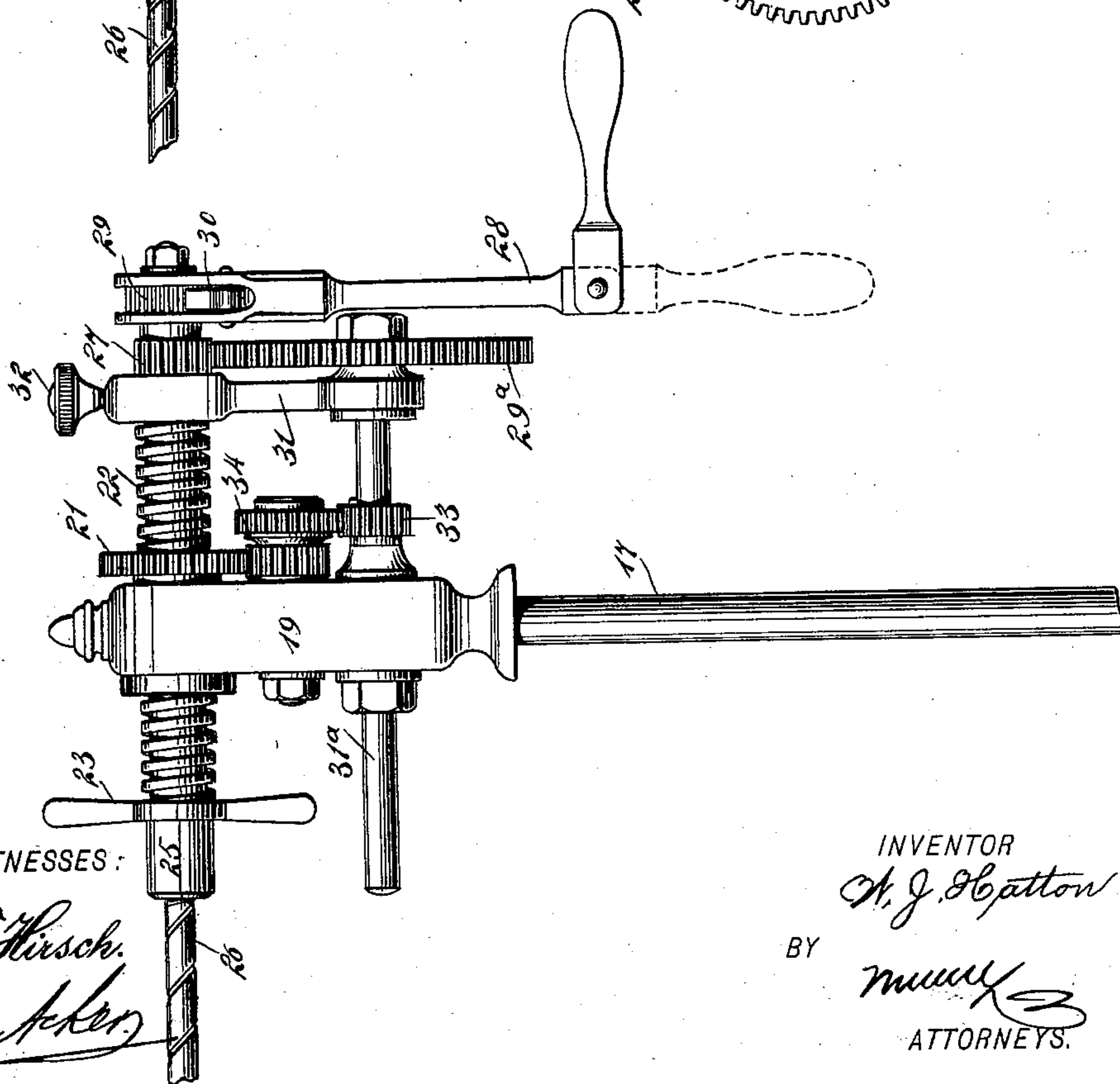


Fig. 6.



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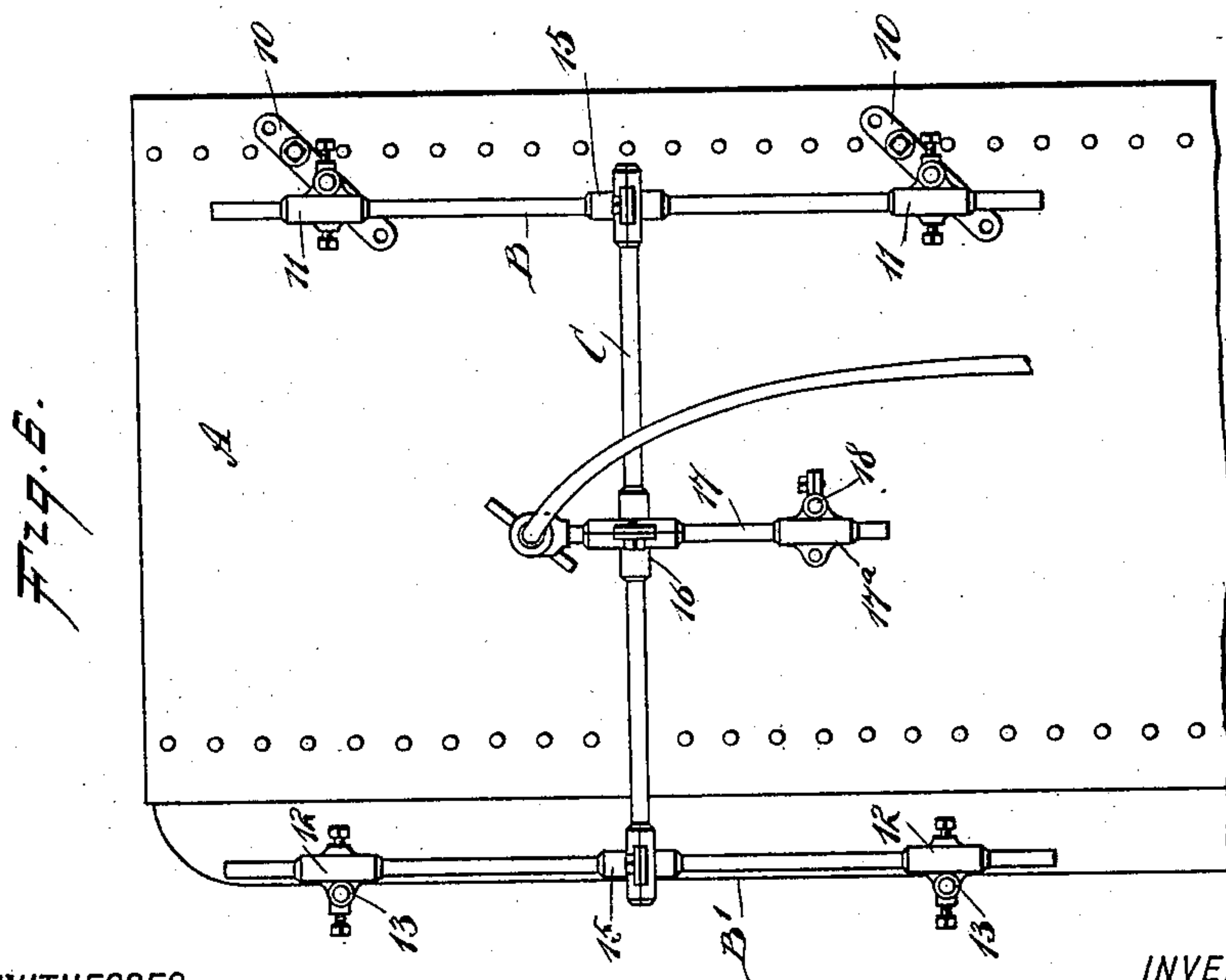
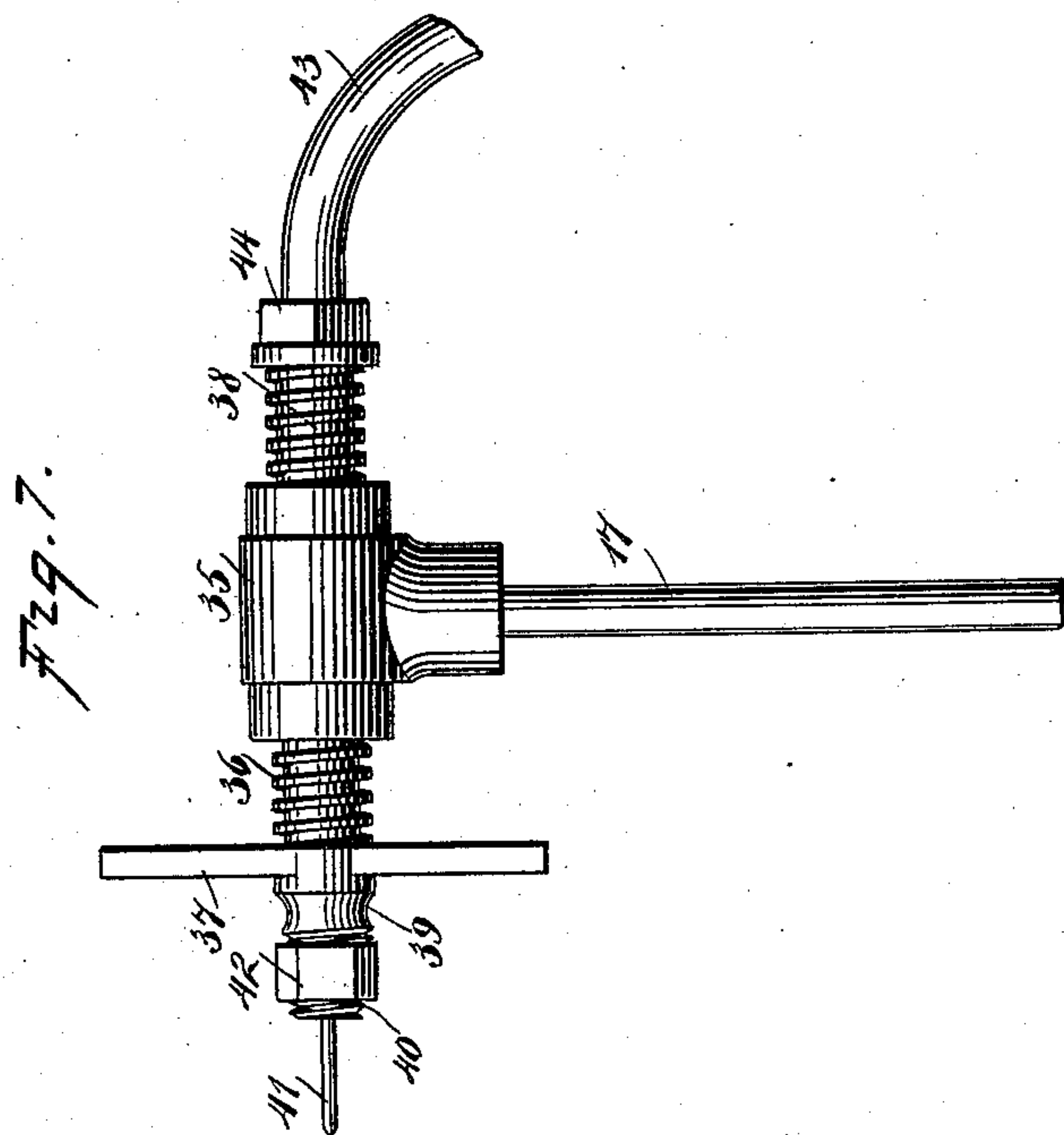
(No Model.)

3 Sheets—Sheet 3.

W. J. HATTON.
DRILL.

No. 592,142.

Patented Oct. 19, 1897.



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UNITED STATES PATENT OFFICE.

WILLIAM J. HATTON, OF ESCANABA, MICHIGAN.

DRILL.

SPECIFICATION forming part of Letters Patent No. 592,142, dated October 19, 1897.

Application filed April 2, 1897. Serial No. 630,394. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. HATTON, of Escanaba, in the county of Delta and State of Michigan, have invented a new and Improved Drill, of which the following is a full, clear, and exact description.

The object of my invention is to provide a drill especially adapted for making the rivet-holes in boilers, but which may be used with equally good results in connection with any work where a similar opening is to be produced.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of a boiler, illustrating the application thereto of the device. Fig. 2 is a rear elevation of the boiler to which the device is applied. Fig. 3 is a side elevation of the drilling device. Fig. 4 is a longitudinal section through the drilling device. Fig. 5 is a section taken substantially on the line 5 5 of Fig. 4. Fig. 6 is a side elevation of a boiler, showing the application of the device thereto, provided with a hand-feed and adapted to be driven by a flexible shaft or power other than manual power; and Fig. 7 is a side elevation of the modified form of the device.

Two uprights B and B' are employed, which are in the nature of rods, the uprights B being adjustably mounted in sockets 11, and the uprights B' correspondingly mounted in sockets 12. The sockets 11 are shown as adjustably connected with tie-plates 10, which are screwed or bolted to the boiler near one edge, while arms 13 are adjustably attached to the sockets 12, carrying the uprights B', the said arms 13 having longitudinal openings 14 made therein, through which bolts are passed into a side of the boiler, as illustrated in Fig. 2. Under this construction the uprights B and B' are held a predetermined distance from the surface of the boiler to be drilled,

or the surface of any other object in which holes are to be made.

Between the ends of the uprights B and B' sleeves or sockets 15 are adjustably secured, and these sleeves or sockets support the ends of a cross-rod C, which carries an adjustable sleeve 16. The said adjustable sleeve carries a standard 17, which at its lower end is provided with an adjustable socket 17^a, and in said socket a pin 18 is secured, which engages with the surface of the article to be bored, holding the drill to be hereinafter described a predetermined distance from the said object, as shown in Fig. 2. If in practice it is found desirable, however, the lower end of the post or standard 17 may be secured to the boiler, or the article to be drilled or bored, in any suitable manner.

The drill is best shown in Figs. 3 and 4, in which the upper end of the standard or upright 17 is enlarged, forming practically a bearing-surface 19, as shown in the said figures. In the upper portion of the bearing-surface 19 a nut 20 is held to revolve, being provided at one end with a gear 21. An exteriorly-threaded hollow shaft 22 is held to turn in the said nut, being provided at its forward end with a hand-wheel 23, or a device of like character. A solid shaft 24 is mounted to turn loosely in the exteriorly-threaded hollow shaft, the inner solid shaft 24 being provided with a head 25, a chuck, or its equivalent, at its forward end, in which the bit or drill 26 is secured.

Near the end of the hollow exteriorly-threaded shaft, opposite that end where the drill is attached, a pinion 27 is mounted to freely revolve, which pinion is fast to or is connected with an arm 28, the said arm being provided with a dog 30, adapted for engagement with a ratchet-wheel 29, secured on the shaft 24. A hanger 31 is passed loosely around the threaded hollow shaft 22, and at its lower end journals a portion of a shaft 31^a, the said shaft being journaled at or near its center in the upper portion 19 of the upright 17, as is clearly shown in Fig. 4. The shaft 31^a carries a gear 29^a, which meshes with the pinion 27, and on the said shaft 31^a, which is the

driven shaft, a pinion 33 is splined, being so mounted that the shaft may slide through the pinion yet the pinion will turn with the shaft. The pinion 33 meshes with a pinion 34, carried by the upper end 19 of the standard 17, which gear is a double gear, and one of its toothed surfaces is made to mesh with the gear 21 on the loosely-mounted nut 20, serving to turn the latter.

In operation, the drilling mechanism may be carried vertically to any desired point on the boiler or the article that is to be drilled, and likewise may be adjusted vertically to any position necessary. As the ratchet-arm 28 is revolved the drill is turned, and a rotary motion is communicated to the driven shaft 31^a, which in its turn communicates motion to the threaded hollow shaft 22, which is the feed-shaft, and consequently the said feed-shaft moves the drill a certain distance forward as the drilling continues, the feed being possible since the feed-shaft, the drill-shaft, and the driven shaft will all move forward together. A set-screw 32 is located in the upper end of the hanger 31, engaging with the wall of an annular recess on the exterior of the threaded and tubular shaft 22. If at any time the automatic feed is not required, or if a further feed is desired either backward or forward, such movement may be accomplished by turning the hand-wheel 23.

I desire it to be understood that any support other than that shown may be employed for the drilling device, and that the drilling device may be pneumatically or hydraulically operated, or operated through the medium of a flexible shaft, and that the feed instead of being automatic, as illustrated, may be manually accomplished.

In Figs. 6 and 7 I have illustrated a slightly-modified form of the device, in which an interiorly-threaded sleeve 35 is secured upon the standard 17. An exteriorly-threaded and hollow adjusting-shaft 36 is passed through the said sleeve, the adjusting-shaft being provided with a hand-wheel or a hand-grip 37, whereby it may be turned. A drill-shaft 38 is mounted to revolve in the feed-shaft, being provided with a head 39 at its forward end, and a tapering exteriorly-threaded and split holder 40, the holder being preferably a continuation of the drill-shaft, being adapted to receive a drill 41 or other tool, which tool is held firmly in the holder by a lock-nut 42, arranged to admit of the expansion of the sections of the split tool-holder and to draw the said sections together. A flexible shaft 43 is shown attached to the rear end of the drill-shaft, and a nut 44 is placed at the rear portion of the device, serving in connection with the head 39 to prevent end movement of the drill-shaft, and the said nut 44 may likewise serve as a means for securing the flexible shaft to the drill-shaft. Instead of the flexible shaft being used as the driving me-

dium, compressed air, or any other mechanical power, may be substituted.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a drilling apparatus, a supporting-frame consisting of independent uprights, fastening devices having vertical and lateral adjustment thereon, an adjustable cross-bar connecting the uprights, and an adjustable socket carried by the cross-bar, arranged to receive the drilling device, substantially as shown and described.

2. A support for a drilling device, consisting of uprights, sockets adjustable upon the uprights, fastening devices adjustably connected with said sockets, a cross-bar adjustably attached to the uprights, a socket adjustable upon the cross-bar, a standard which is a portion of the drilling device, a socket adjustable upon said standard, and a guide carried by the latter socket, all arranged for operation substantially as set forth.

3. In a drilling device, the combination, with a support, a nut held to turn in said support, and means for turning the nut, of an exteriorly-threaded tubular feed-shaft passed through said nut and provided with a hand-grip, a drill-shaft mounted to revolve in the feed-shaft, a tool-holder at one end of the drill-shaft, engaging with the end of the feed-shaft, devices for preventing end movement of the drill-shaft, and means, substantially as described, for driving the drill-shaft, for the purpose set forth.

4. A drilling device consisting of a standard, a nut held to turn in said standard and provided with an attached gear, an exteriorly-threaded and hollow shaft received by the said nut, a drill-shaft mounted to turn in the hollow shaft, having a head which engages with one end of the hollow shaft, and a driving mechanism for the drill-shaft, as and for the purpose set forth.

5. In a drill, the combination, with a standard, a nut held to turn in the standard, provided with an attached gear, an exteriorly-threaded hollow shaft received by the said nut and provided with projections at its forward end, and a drill-shaft held to turn in the hollow shaft, provided with a head engaging with one end of said tubular shaft, of means, substantially as shown and described, for revolving the drill-shaft, a shaft driven by said driving mechanism, mounted to turn and to have end movement in the said standard, and a gear connection between the driven shaft and the gear on the said nut, as and for the purpose set forth.

6. In a drill, the combination, with a standard, a nut provided with an attached gear held to turn in the said standard, a tubular shaft exteriorly threaded, received by the said nut, a drill-shaft held to turn in the tubular shaft, having a projection at one of its ends,

forming a shoulder for engagement with the
tubular shaft, and a ratchet-and-pawl device
for turning the drill-shaft, of a driven shaft
mounted to turn and to have end movement
5 in said standard or upright, a gear carried by
the said driven shaft, a pinion carried by the
ratchet-and-pawl driving mechanism, mesh-
ing with the said gear, a pinion splined upon
the driven shaft, and a double gear, one sur-

face of which double gear meshes with the 10
said pinion and the other surface with the
gear on the said nut, substantially as and for
the purpose specified.

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